

CLAIMS

What is claimed is:

1. A communication system, comprising:

5 a pre-whitening device adapted to apply pre-whitening data to a received signal to produce a pre-whitened signal;

at least one detector that is adapted to recognize a pattern corresponding to a request for access in the pre-whitened signal and compute correlation data corresponding to the pattern; and

10 a threshold detector adapted to determine whether the correlation data exceeds a threshold and indicates that an acknowledgement signal should be transmitted if the threshold is exceeded.

2. The system set forth in claim 1, wherein the correlation data comprises
15 a correlation matrix.

3. The system set forth in claim 2, wherein the at least one detector is adapted to compute at least one maximum eigenvalue of the correlation matrix.

20 4. The system set forth in claim 1, wherein the correlation data is used to compute a maximum energy level for the pre-whitened signal.

5. The system set forth in claim 1, wherein the at least one detector is adapted to recognize the pattern in a specific beam of a fixed beam network.

6. The system set forth in claim 1, wherein the communication system comprises at least a portion of a cellular base station.

5 7. The system set forth in claim 1, wherein the pre-whitening data comprises a pre-whitening matrix.

8. A method for operating a communication system, the method comprising the acts of:

10 creating a pre-whitened signal by applying pre-whitening data to a received signal;

detecting a pattern that corresponds to a request for access in the pre-whitened signal;

computing correlation data corresponding to the pattern;

determining whether the correlation data exceeds a threshold; and

15 indicating that an acknowledgement signal should be transmitted if the threshold is exceeded.

9. The method set forth in claim 8, comprising the act of defining the correlation data to comprise a correlation matrix.

20 10. The method set forth in claim 9, comprising the act of computing at least one maximum eigenvalue of the correlation matrix.

25 11. The method set forth in claim 8, comprising the act of using the correlation data to compute a maximum energy level for the pre-whitened signal.

12. The method set forth in claim 8, comprising the act of recognizing the pattern in a specific beam of a fixed beam network.

5 13. The method set forth in claim 8, comprising the act of defining a pre-whitening matrix to correspond to the pre-whitening data.

14. A communication system, comprising:

means for applying pre-whitening data to a received signal to produce a pre-

10 whitened signal;

means for recognizing a pattern in the pre-whitened signal, the pattern

corresponding to a request for access;

means for computing correlation data corresponding to the pattern; and

means for determining whether the correlation data exceeds a threshold and for

15 providing an indication if the threshold is exceeded.

15. A cellular base station, comprising:

an antenna array that receives a communication signal;

a pre-whitening device adapted to apply pre-whitening data to the

20 communication signal to produce a pre-whitened signal;

at least one detector adapted to recognize a pattern corresponding to a request

for access in the pre-whitened signal and compute correlation data

corresponding to the pattern;

a threshold detector adapted to determine whether the correlation data exceeds
a threshold and indicate that an acknowledgement signal should be
transmitted if the threshold is exceeded; and
processing circuitry adapted to support a communication session if an
5 acknowledgement signal is transmitted.

16. The cellular base station set forth in claim 15, wherein the correlation
data comprises a correlation matrix.

10 17. The cellular base station set forth in claim 16, wherein the at least one
detector computes at least one maximum eigenvalue of the correlation matrix.

18. The cellular base station set forth in claim 15, wherein the correlation
data is used to compute a maximum energy level for the pre-whitened signal.

15 19. The cellular base station set forth in claim 15, wherein the pre-
whitening data comprises a pre-whitening matrix.

20. A tangible computer-readable medium, comprising:
20 programming instructions stored on the computer-readable medium for
applying pre-whitening data to a received signal to produce a pre-
whitened signal;
programming instructions stored on the computer-readable medium for
recognizing a pattern in the pre-whitened signal, the pattern
25 corresponding to a request for access;

programming instructions stored on the computer-readable medium for
computing correlation data corresponding to the pattern; and
programming instructions stored on the computer-readable medium for
determining whether the correlation data exceeds a threshold and for
5 providing an indication if the threshold is exceeded.